



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/776,555

02/10/2004

Joel V. Madison

EIC-401

5453

46770

7590

01/30/2009

RAY K. SHAHANI, ESQ., ATTORNEY AT LAW
TWIN OAKS OFFICE PLAZA
477 NORTH NINTH AVENUE, SUITE 112
SAN MATEO, CA 94402-1858

EXAMINER

KIM, JOHN K

ART UNIT

PAPER NUMBER

2834

MAIL DATE

DELIVERY MODE

01/30/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/776,555	Applicant(s) MADISON, JOEL V.	
	Examiner JOHN K. KIM	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7,9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3,5,7,9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action is in response to papers filed on 24 March 2008. Amendments made to the claims and Applicant's remarks have been entered and considered.
2. Claims 1, 3, 5, 7, 9 and 11 are pending and are presented for examination.

Response to Arguments

3. Applicant amended claim with new limitations and therefore arguments moot.
4. The examiner's supplementary responses to the arguments are herewith presented respectively.
5. The applicant or the representative argued as "... *While the Court recently slightly eased up on the requirement for a finding of the traditional "suggestion-teaching-motivation" in obviating prior art, it clearly cannot have intended the Patent Office to completely do away with the well known doctrine that hindsight reconstructions based on the Applicants' own invention are vehemently forbidden.* In re Fritch, 23 U.S.P.Q. 2d 1780, 1784 (Fed. Cir. 1992)".

The examiner believes motivation remarked in the office action would have been appreciated by those of ordinary skilled in the art. However, to satisfy the applicant better, 'suggestion or teaching and motivation to combine with rational reasoning' has been described with more detail. In broad meaning, it is clear that Fisher is teaching use of spacer between bearing and torque control means (centrifugal mechanism). The spacer is stationary and said torque control means is composure of many elements. The examiner believes the spacer can be applied to another analog mechanism for those ordinary skilled in the art keeping the same idea.

The argument continues as “... *In the present case, Examiner has cited 3 prior art references all directed to electric motors, not electric generators, turbines or pumps*”.

The examiner respectfully disagrees. Electric motors and electric generators are analog and interchangeable. The motor of Fisher can be used for generator only by applying mechanical input to the shaft. (see reference list below) For those ordinary skilled in the art, it is well understood. It is notoriously old and well known that generator can be a turbine and pumps are operated by motor.

Applicant's remark that “(*machines in*) the cited prior art references are completely unrelated to cryogenic liquid handling equipment” is therefore totally unpersuasive.

6. Drawing objection has been withdrawn.

7. List of references for official notice.

- Turner (US 6906490) ; see col. 2, line 23-36 for motor-generator interchangeable.
- Desta et al (US 2003/0122436) : See Abstract for generator having the same machine configuration as that of Fisher.
- Dickinson et al (US 2007/0063608) : See [0002] for generator or motor having the same machine configuration as that of Fisher.
- Due to copyright issue, the examiner can not present copy of the book but the following scientific book is very helpful to study the theory and principle. If further and depth understanding needed, please find this

book. "Miller TJE [2001] [Ed] 'Electronic Control of Switched Reluctance Machines'. Newnes Publishers, c.272pp, ISBN 0 7506 5073 7"

- For technical reference of the fact "stainless steel and thermal coefficient of fiber glass is lower than that of stainless steel", please find attached fiberglass.pdf (NPL).
- For shaft made of stainless steel, Dickinson et al (US 2007/0063608) [0060], Corengia (US 2005/0104467) [0010] and Pop (US 2002/0047426) [0055].

Response to Amendment

8. The claims 1, 5 and 9 have been amended, and therefore, the rejections are amended accordingly. The examiner reviewed amended claims and remarks as follows.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 3, 7 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims refer 'operating parameters' and 'temperature range'. However those values are not specified. Therefore, the height of the spacer selected according to

Art Unit: 2834

desired thrust equalizing mechanism operating parameters over the temperature range is indefinite accordingly. For the purpose of examination, the examiner interprets the height of the spacer is selected operable over the temperature range of the machine.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1, 3, 5, 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Applicant Admitted Prior Art) in view of Fisher et al (US 6215214) and in further view of Agnes et al (US 6570284).

Art Unit: 2834

As for claim 1, AAPA shows (in Figs. 1-2) and discloses for a cryogenic liquid turbine generator or pump having main product-lubricated bearings (6) separated by a span of shaft (4) and a thrust equalizing mechanism (line 7-8, Page 4) adjacent one of said main bearings (6). AAPA however failed to show or disclose an improvement comprising (1) a stationary spacer interposed between the thrust equalizing mechanism and its adjacent main bearing to reduce the span between said main bearings, wherein (2) the spacer is composed of material that shrinks less than the shaft of the generator.

Re (1), Fisher teaches (in Fig. 5) a stationary spacer (258) interposed between centrifugal mechanism (258) and its adjacent main bearing (216) to reduce the span (256) between said main bearings (col. 5, line 1-23). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a stationary spacer interposed between the thrust equalizing mechanism and its adjacent main bearing to reduce the span between said main bearings by combining the teaching of Fisher with that of AAPA for preventing deflection of rotor shaft during heavy side loading. (col. 2, line 29-34)

Re (2), Agnes shows (in Fig. 7) and discloses a spacer (54) is composed of material of fiberglass. Agnes however is silent to disclose the fiber glass shrinks less than the shaft of the generator. However it is well known in the art that shaft is made of stainless steel and thermal coefficient of fiber glass is lower than that of stainless steel, and motor and generator are same machine that are exchangeable. Hence, the examiner take official notice regarding the fiber glass shrinks less than the shaft of the generator. Therefore, it would have been obvious to a person of ordinary skill in the art

Art Unit: 2834

at the time the invention was made to have the spacer is composed of material that shrinks less than the shaft of the generator by combining teachings of Agnes to AAPA to incorporate a double insulation feature and thereby eliminating the need for a direct ground cable by construction of a non-conductive, electrically insulating material. (col. 3, line 32-35, col. 7, line 32-35)

As for claim 3, AAPA in view of Fisher and in further view of Agnes shows and discloses the claimed invention as applied to claim 1 above. Agnes further shows (in Fig. 7) and discloses a spacer (54) made of fiberglass, and therefore it has operating parameters over a temperature range as the maximum temperature of fiberglass (at least 1550 degree F) typically exceeds the design temperature of generator/pump (typically 180 degree C or less). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the height of the spacer selected according to desired thrust equalizing mechanism operating parameters over temperature range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As for claim 5, AAPA shows (in Figs. 1-2) and discloses, for a cryogenic liquid turbine generator or pump having product-lubricated main bearings (6) separated by a span of shaft (4) and a thrust equalizing mechanism (line 7-8, Page 4) which includes a

Art Unit: 2834

stationary thrust plate (8) adjacent one of the main bearings (6) and a variable orifice (20) defined between the thrust plate (8) and a throttle plate (10) affixed to the shaft (4).

AAPA, however, failed to teach or suggest an improvement comprising (1) a stationary length compensator interposed between the thrust plate and its adjacent main bearing to space said adjacent main bearing from the thrust plate in order to reduce the span between said main bearings, (2) wherein the spacer is composed of material that shrinks less than the shaft of the generator.

Re (1), Fisher shows (in Fig. 5) and discloses a stationary length compensator (268) interposed between centrifugal mechanism (258) and its adjacent main bearing (216) to space said adjacent main bearing (6) from the centrifugal mechanism in order to reduce (col. 5, line 1-23) the span (256) between said main bearings (216, 218). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the stationary length compensator interposed between the thrust plate (8, AAPA) instead of centrifugal mechanism and its adjacent main bearing to space said adjacent main bearing from the thrust plate in order to reduce the span between said main bearings by combining the teaching of Fisher with that of AAPA for preventing deflection of rotor shaft during heavy side loading. (col. 2, line 29-34)

Re (2), Agnes shows (in Fig. 7) and discloses a spacer (54) is composed of material of fiberglass. Agnes however is silent to disclose the fiber glass shrinks less than the shaft of the generator. However it is well known in the art that shaft is made of stainless steel and thermal coefficient of fiber glass is lower than that of stainless steel,

Art Unit: 2834

and motor and generator are same machine that are exchangeable. Hence, the examiner take official notice regarding the fiber glass shrinks less than the shaft of the generator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the spacer is composed of material that shrinks less than the shaft of the generator by combining teachings of Agnes to AAPA to incorporate a double insulation feature and thereby eliminating the need for a direct ground cable by construction of a non-conductive, electrically insulating material. (col. 3, line 32-35, col. 7, line 32-35)

As for claim 7, except claim dependency, the claim contains the same limitation as claim 3 and is rejected for the same reason set forth in connection with the rejection of claim 3 above.

As for claim 9, AAPA shows (in Figs. 1-2) and discloses for a cryogenic liquid turbine generator or pump having product-lubricated main bearings separated by a span of shaft and a thrust equalizing mechanism (line 7-8, Page 4) which includes a stationary thrust plate (8) adjacent one of the main bearings (6).

AAPA however failed to show or disclose an improvement comprising (1) stationary means interposed between the thrust plate and its adjacent main bearing to space said adjacent main bearing from the thrust plate in order to reduce the span between said main bearings, (2) wherein the spacer is composed of material that shrinks less than the shaft of the generator.

Art Unit: 2834

Re (1), Fisher shows (in Fig. 5) and discloses a stationary means (268) interposed between centrifugal mechanism (258) and its adjacent main bearing (216) to space said adjacent main bearing (6) from the centrifugal mechanism in order to reduce (col. 5, line 1-23) the span (256) between said main bearings (216, 218). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the stationary means interposed between the thrust plate (8, AAPA) instead of centrifugal mechanism and its adjacent main bearing to space said adjacent main bearing from the thrust plate in order to reduce the span between said main bearings by combining the teaching of Fisher with that of AAPA for preventing deflection of rotor shaft during heavy side loading. (col. 2, line 29-34)

Re (2), Agnes shows (in Fig. 7) and discloses a spacer (54) is composed of material of fiberglass. Agnes however is silent to disclose the fiber glass shrinks less than the shaft of the generator. However it is well known in the art that shaft is made of stainless steel and thermal coefficient of fiber glass is lower than that of stainless steel, and motor and generator are same machine that are exchangeable. Hence, the examiner take official notice regarding the fiber glass shrinks less than the shaft of the generator. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the spacer is composed of material that shrinks less than the shaft of the generator by combining teachings of Agnes to AAPA to incorporate a double insulation feature and thereby eliminating the need for a direct ground cable by construction of a non-conductive, electrically insulating material. (col. 3, line 32-35, col. 7, line 32-35)

As for claim 11, except claim dependency, the claim contains the same limitation as claim 3 and is rejected for the same reason set forth in connection with the rejection of claim 3 above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The fax phone number for the examiner where this application or proceeding is assigned is 571-270-6072. The examiner can normally be reached on M-F 8-5.

Art Unit: 2834

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on 571-272-8188.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen P Leung/
Supervisory Patent Examiner, Art Unit 2834

JK